CHECKLIST FOR REVIEW OF WORKPLANS

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This is a checklist for the project hydrogeologist to use during review of the plans for drilling and sampling at hazardous and toxic waste sites. The checklist represents a general list of considerations for typical projects; not all items are always appropriate.
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OBJECTIVES

General

1. Are objectives of sampling clear? Y___N___N/A___

2. Is rationale for sampling locations and analyses presented? Y___N___N/A___

3. Is overall level of effort consistent with objectives? Y___N___N/A___

4. Are all media addressed which are involved in objectives? Y___N___N/A___

5. All obvious data gaps are addressed? Y___N___N/A___

6. Is the potential for other sources addressed? Y___N___N/A___

Ground Water

1. Are upgradient wells included? Y___N___N/A___

2. Will well locations address the plume's horizontal extent? Y___N___N/A___

3. Do well locations address determination of vertical extent/gradients? Y___N___N/A___

4. Are samples taken for screen slot size design? Y___N___N/A___

5. Does the Plan address TDS/cations/anions? Y___N___N/A___

6. Are existing production wells utilized? Y___N___N/A___

Soils

1. Are background concentrations addressed? Y___N___N/A___

2. Are the soil sampling depths adequate to define vertical extent? Y___N___N/A___

3. Are the soil sampling locations adequate to determine lateral extent? Y___N___N/A___

4. Are soil samples taken for geotechnical analyses? Y___N___N/A___

5. Are soil geotech testing requirements specified? Y___N___N/A___

6. Are soil TOC values addressed? Y___N___N/A___

SITE BACKGROUND

General

1. Is regional geology presented (stratigraphy)? Y___N___N/A___

2. Is regional hydrogeology presented? Y___N___N/A___

3. Is climate/precipitation/evaporation presented? Y___N___N/A___

4. Are previous sampling points shown on maps? Y___N___N/A___

5. Is an adequate site history presented?
   Include: Y___N___N/A___
   dates of use? Y___N___N/A___
   chemicals used? Y___N___N/A___
   locations of use/disposal? Y___N___N/A___

6. Have air photos been used? Y___N___N/A___

7. Is a good site location map presented? Y___N___N/A___

Ground Water

1. Are ground water contours presented or

depth to water presented? Y___N___N/A___

2. Are estimates of permeability given? Y___N___N/A___

3. Are vertical gradients discussed? Y___N___N/A___

4. Are previous well sampling results presented? Y___N___N/A___

5. Are water concentrations given graphically? Y___N__N/A___

6. Are existing production wells known? Y___N___N/A__

7. Is relationship between aquifer(s) being investigated and other (shallow or deep) aquifers described? Y___N___N/A__

Soils

1. Are previous soil sampling results presented? Y___N___N/A___

2. Are results given graphically? Y___N___N/A___

Organization

1. Are project personnel listed? Y___N___N/A___

2. Are project responsibilities defined? Y___N___N/A___

3. Will a geologist/geotechnical engineer be on site for logging and well installation? Y___N___N/A___

IMPLEMENTATION

General

1. Is the drilling method specified? Y___N___N/A___

2. Are field monitoring equipment calibration procedures addressed? Y___N___N/A___

3. Are sampling utensils to be decontaminated between samples? Y___N___N/A___

4. Is auger/drill stem and rig to be decontaminated between holes? Y___N___N/A___

5. Are sample numbers explained adequately? Y___N___N/A___

6. Are QA/QC samples taken and will they to be blind to the analyst? Y___N___N/A___

7. Are samples properly labelled and packaged? * * Y___N___N/A___

8. Are chain-of-custody procedures adequately defined? Y___N___N/A___

9. Does the plan indicate adequate amounts of ice? Y___N___N/A___

10. Is disposal for wastes generated during drilling or sampling operations adequately addressed? Y___N___N/A___

11. Is an equipment list provided for field crew? Y___N___N/A___

Drilling and Soils Sampling

1. Are duplicate soils samples taken in an appropriate manner to give representative data? Y___N___N/A___

2. Is field screening done consistently? Y___N___N/A___

3. Are volatiles samples taken first and not composited or homogenized? Y___N___N/A___

4. Are wide mouth jars used for soils? Y___N___N/A___

5. Is settlement of sandy soils in the jars addressed? Y___N___N/A___

6. Are stainless steel split spoons used? Y___N___N/A___

7. Are borings properly abandoned/decommissioned? Y___N___N/A___

8. Are rock core to be properly boxed and photographed? Y___N___N/A___

9. Are core logging parameters described? Y___N___N/A___

10. Will boring/sampling location coordinates be determined by survey? Y___N___N/A___

Well Installation

1.	Is screen placement consistent with contaminant type?	Y___N___N/A___
2.	Are slug tests planned (no water added?)?	Y___N___N/A___
3.	Is data reduction methodology described for slug tests/pump test?	Y___N___N/A___
4.	Are screen and casing materials compatible with the contaminant type?	Y___N___N/A___
5.	Filter pack extend 2-3' above the screen?	Y___N___N/A___
6.	Bentonite seal to be adequately hydrated or fine sand placed to prevent grout intrusion?	Y___N___N/A___
7.	Screen slot size appropriate for the site?	Y___N___N/A___
8.	Casing/screen joined properly?	Y___N___N/A___
9.	Is there a minimum of 2" of annular space all around screen?	Y___N___N/A___
10.	Is casing schedule adequate for anticipated pressures/tension in installation?	Y___N___N/A___
11.	Is grout placed appropriately and to the proper level?	Y___N___N/A___
12.	Are wells to be developed by surging or bailing?	Y___N___N/A___
13.	Is an amount of water equal to water loss to be removed in development?	Y___N___N/A___
14.	Will post-development well water be photographed?	Y___N___N/A___
15.	Are the wells adequately protected?	Y___N___N/A___
16.	Are locks keyed alike?	Y___N___N/A___
17.	Are there internal mortar collar and drain	

holes in protective casing? Y___N___N/A___

18. Are well abandonment procedures described? Y___N___N/A___

19. Is well sump provided? (sump not recommended) Y__N__N/A__

20. Is the concrete/gravel pad described and adequate? Y___N___N/A___

21. Are the wells coordinates and elevations determined? Y___N___N/A___

Well Sampling

1. Is purging pump-bailer type specified? Y___N___N/A___

2. Is purge volume reasonable and calculated correctly? Y___N___N/A___

3. Is the stagnant water above the top of the screen adequately purged? Y___N___N/A___

4. Is sampling pump/bailer described? Y___N___N/A___

5. Is water level taken before purging? Y___N___N/A___

6. Is floating product measurement technique described? Y___N___N/A___

7. Are water levels taken in a single round? Y___N___N/A___

8. Are sample preservatives clearly described? Y___N___N/A___

REPORTING

1. Are boring log forms shown (preference for COE)? Y___N___N/A___

2. Are logs to be presented at adequate scale? Y___N___N/A___

3. Are all standard parameters to be recorded? Y___N___N/A___

4. Is a hard bound log book kept? Y___N___N/A___

5.	Are geotechnical transmittals described?	Y___N___N/A___
6.	Are daily quality control reports described?	Y___N___N/A___
7.	Are chain of custody forms described?	Y___N___N/A___
8.	Are all sampling points adequately surveyed and mapped?	Y___N___N/A___
9.	Are sample well construction diagrams provided?	Y___N___N/A___
10.	Are all proper well installation details to be shown?	Y___N___N/A___
11.	Are sample well development forms given?	Y___N___N/A___
12.	Any provisions for data management (data base for site data)?	Y___N___N/A___

GENERAL

1.	Do figures have scale, north arrow?	Y___N___N/A___
2.	Is a table of contents provided?	Y___N___N/A___
3.	Has the work plan met all requirements of the scope-of-work?	Y___N___N/A___

**According to the Sample Handling Protocol in ER 1110-1-263